



<110> IWAKURA, Masahiro

<120> Sulfur Atom-Free Enzyme Protein

<130> 4853.0084

<140> US 10/019,409

<141> 2001-12-28

<150> PCT/ JP00/02112

<151> 2000-03-31

<150> JP/ 183664

<151> 1999-06-29

<160> 10

<170> PatentIn version 3.1

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35 40 45

Ser Ile Gly Arg Pro Leu Pro Gly Arg Lys Asn Ile Ile Leu Ser Ser
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Gln Pro Gly Thr Asp Asp Arg Val Thr Trp Val Lys Ser Val Asp Glu
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Ala Ile Ala Ala Ala Gly Asp Val Pro Glu Ile Met Val Ile Gly Gly
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Gly Arg Val Tyr Glu Gln Phe Leu Pro Lys Ala Gln Lys Leu Tyr Leu
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Thr His Ile Asp Ala Glu Val Glu Gly Asp Thr His Phe Pro Asp Tyr
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<222> (81)..(557)

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Leu Ala Trp Phe Lys Arg Asn Thr Leu Asn Lys Pro Val Ile Met Gly
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Lys	Ser	Val	Asp	Glu	Ala	Ile	Ala	Ala	Ala	Gly	Asp	Val	Pro	Glu	Ile	
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His	Phe	Pro	Asp	Tyr	Glu	Pro	Asp	Asp	Trp	Glu	Ser	Val	Phe	Ser	Glu	
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<213> Bacillus subtilis

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Arg	Asn	Thr	Leu	Asn	Lys	Pro	Val	Ile	Tyr	Gly	Arg	His	Thr	Trp	Glu		
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Ala Ile Ala Ala Ala Gly Asp Val Pro Glu Ile Phe Val Ile Gly Gly
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Gly Arg Val Tyr Glu Gln Phe Leu Pro Lys Ala Gln Lys Leu Tyr Leu
100 105 110

Thr His Ile Asp Ala Glu Val Glu Gly Asp Thr His Phe Pro Asp Tyr
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<222> (81)..(560)

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Asp Arg Val Ile Gly Asn Glu Asn Ala Leu Pro Trp Asn Leu Pro Ala
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gat ctc gcc tgg ttt aaa cgc aac acc tta aat aaa ccc gtg att tac 209
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aat att atc ctc agc agt caa ccc ggg acc gat gat cgg gtt acc tgg 305
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gcg Ala	caa Gln	aag Lys 110	ctt Leu	tat Tyr	ctg Leu	acg Thr	cat His 115	atc Ile	gat Asp	gca Ala	gaa Glu	gtg Val 120	gaa Glu	ggc Gly	gac Asp	449
acc Thr	cat His 125	ttt Phe	ccg Pro	gat Asp	tac Tyr	gag Glu 130	ccg Pro	gat Asp	gac Asp	tgg Trp	gaa Glu 135	tcg Ser	gta Val	ttc Phe	agc Ser	497
gaa Glu 140	ttc Phe	cac His	gat Asp	gct Ala	gat Asp 145	gcg Ala	cag Gln	aac Asn	tcg Ser	cat His 150	agc Ser	tat Tyr	tcg Ser	ttc Phe	gaa Glu 155	545
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Glu	Asn	Ala	Leu 20	Pro	Trp	Asn	Leu	Pro 25	Ala	Asp	Leu	Ala	Trp 30	Phe	Lys
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Arg	Asn	Thr 35	Leu	Asn	Lys	Pro	Val 40	Ile	Tyr	Gly	Arg	His 45	Thr	Trp	Glu
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Ser	Ile 50	Gly	Arg	Pro	Leu	Pro 55	Gly	Arg	Lys	Asn	Ile 60	Ile	Leu	Ser	Ser
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Ala Ile Ala Ala Ala Gly Asp Val Pro Glu Ile Phe Val Ile Gly Gly
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 Arg Ser Pro Leu Ile Glu Tyr Tyr Val Val Asp Ser Trp Gly Thr Tyr
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 Tyr Asp Ile Tyr Thr Thr Thr Arg Tyr Asn Ala Pro Ser Ile Asp Gly
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 Asp Arg Thr Thr Phe Thr Gln Tyr Trp Ser Val Arg Gln Ser Lys Arg
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 Pro Thr Gly Ser Asn Ala Thr Ile Thr Phe Ser Asn His Val Asn Ala
 305 310 315 320
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Ser Ile Gly Arg Pro Leu Pro Gly Arg Lys Asn Ile Ile Leu Ser Ser
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Gln Pro Gly Thr Asp Asp Arg Val Thr Trp Val Lys Ser Val Asp Glu
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Ala Ile Ala Ala Ala Gly Asp Val Pro Glu Ile Phe Val Ile Gly Gly
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Gly Arg Val Tyr Glu Gln Phe Leu Pro Lys Ala Gln Lys Leu Tyr Leu
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Thr His Ile Asp Ala Glu Val Glu Gly Asp Thr His Phe Pro Asp Tyr
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Glu Pro Asp Asp Trp Glu Ser Val Phe Ser Glu Phe His Asp Ala Asp
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Ala Gln Asn Ser His Ser Tyr Ser Phe Glu Ile Leu Glu Arg Arg Gly
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Gly Gly Gly Ser Gly Gly Gly Gly Ala Ser Thr Asp Tyr Trp Gln Asn
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Trp

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